IN THE PACE OF THE COLD

When the full moon hangs high overhead, the snow creaks underfoot, the north wind roars with furious blast, and the trees of the forests crack in the frost with a report like that of cannon, then, hanging in its little nest on the bare branches of the wind-tossed trees, the tiny caterpillar of the Viceroy keeps the spark of life where men freeze and die. Nothing in the realm of nature is more wonderful than the manner in which some of the most minute animal forms resist cold. The genera *Erebia* and *CEneis,* and many species of the genus *Brenthis,* are, as we have already learned, inhabitants of the arctic regions or of lofty Alpine summits, the climate of which is arctic. Their caterpillars often hibernate in a temperature of from forty to fifty, and even seventy, degrees below zero, Fahrenheit.

It has been alleged that caterpillars freeze in the winter and thaw out in the spring, at that time regaining their vitality. Thus far the writer is unable to ascertain that any experiments or observations have positively decided for or against this view. A number of recorded cases in which caterpillars are positively stated to have been frozen and to have afterward been found to be full of vitality when thawed are open to question.

The most circumstantial account is that by Commander James Ross, R. N., F. R. S., quoted by Curtis in the Entomological Appendix to the "Narrative" of Sir John Ross's second voyage to the arctic regions. The specimens upon which the observations were made were the caterpillars of

Laria rossi, a moth which is found abundantly in the arctic regions of North America. I quote from the account: "About thirty of the caterpillars were put into a box in the middle of September, and after being exposed to the severe winter temperature of the next three months, they were brought into a warm cabin, where, in less than two hours, every one of them returned to life, and continued for a whole day walking about; they were again exposed to the air at a temperature of about forty degrees below zero, and became immediately hard-frozen; in this state they remained a week, and on being brought again into the cabin, only twenty-three came to life; these were, at the end of four hours, put out once more into the air and again hard-frozen;